Ocean Research Report

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r/v REGINA MARIS EXPEDITION #1

BOSTON, MASSACHUSETTS - NEWFOUNDLAND, CANADA

20 July - 15 September 1976

REPORT ON WHALES IN THE WATERS OF NOVA SCOTIA, NEWFOUNDLAND AND LABRADOR

Cruise Report of

r/v REGINA MARIS EXPEDITION #1
Boston, Massachusetts-Newfoundland, Canada
20 July - 15 September 1976

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SUMMARY

r/v REGINA MARIS departed Boston on 20 July 1976, sailed north through Nova Scotian waters, along the east coast of Newfoundland to Spotted Island, Labrador (approximately 53°N) and returned to Boston on 15 September. The purpose of the first expedition was to identify which cetacean species were found in the coastal waters of the study area during the summer months, and to try to learn which factors determined the locations of each sighted. Nine whale species were seen during the cruise and certain environmental parameters such as water depth and surface water temperatures seemed to be characteristic of a species' range.

INTRODUCTION

Whales have been hunted for many centuries, but only recently have their numbers declined sufficiently to arouse concern about their continued survival. Very little information is known about their reproductive cycles, habitat requirements, social structures or feeding habits. It was therefore the endeavor of this initial voyage to collect more data about cetacea in their natural environments.

METHODS

Throughout the expedition, sighting records of cetacea encountered were kept in a log book, and were later transferred to standardized sighting forms containing: date, time, ship's heading, position, distance and bearing to the whale, species, group size, behavioral comments, sea states and weather conditions. Photographs of the ventral surfaces of humpback whale (Megaptera novaeangliae) flukes were taken when possible, since pigmentation patterns on the flukes are probably unique to an individual and can thus be useful in population studies and stock analyses.

RESULTS

The cruise track for Expedition #1 is shown in Fig. 1, and a summary of whale sightings is given in Table 1. White-beaked dolphins (Lagenorhynchus albirostris) and white-sided dolphins (L. acutus) were the most abundant odontocetes sighted and humpback whales were the most commonly seen mysticete. Mean group sizes with standard deviations for each species are shown in Table 2. Listings of whale sightings are given below.

Finback whale (Balaenoptera physalus)

Number seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
3	23 Jul	0900	42°58'	65°10'	91	-	-
2	27 Jul	0515	-	-	68	12.8	-
6	9 Aug	2000	51°35'	55°00'	130	7.5	-
6+	3 Sep	0900	46°40'	54°50'	100	16.0	12.0
2	"	1330	46°40'	55°00'	100	16.0	12.0

Minke whale (Balaenoptera acutorostrata)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
1	23 Jul	1455	-	-	-	-	-
2	27 Jul	1135	-	-	17	12.2	-
2	"	1355	-	-	17	12.5	-
1	3 Aug	0625	49°42'	53°09'	80	12.0	-
1	"	0930	49°45'	53°13'	80	12.0	-
1	5 Aug	1350	49°49'	54°11'	-	14.5	-
1	7 Aug	AM	-	-	0.6	9.5	-
1	10 Aug	1025	52°36'	55°42'	64	9.5	-
1	17 Aug	1700	51°22'	55°28'	150	12.0	38.0
2	23 Aug	1045	50°14'	55°58'	70	13.0	13.0
1	25 Aug	1615	49°42'	53°10'	79	10.0	15.0
1	"	1720	49°44'	53°08'	74	-	15.0
1	"	1745	49°44'	53°07'	13	-	15.0
1	1 Sep	2005	-	-	-	-	-

Humpback whale (Megaptera novaeangliae)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
6	24 Jul	1145	-	-	17	12.5	-
1	27 Jul	1830	-	-	-	13.0	-
5	2 Aug	1430	48°48'	53°07'	98	12.8	-
1	5 Aug	1010	49°50'	54°16'	100	17.0	-
1	9 Aug	1800	51°25'	54°59'	37	8.0	-
4	10 Aug	1025	52°36'	55°42'	64	9.5	-

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
-4	13 Aug	0845	52°38'	55°40'	100	8.0	43.4
3	"	1330	52°43'	55°44'	60	8.5	43.4
18-22	15 Aug	1000	53°00'	55°43'	100	9.0	-
2	"	1400	53°00'	55°43'	100	9.0	-
4	16 Aug	1400	52°30'	55°30'	150	9.5	-
3	19 Aug	1445	51°42'	55°14'	140	10.0	-
4	"	1745	51°42'	55°03'	150	8.8	-
4-6	25 Aug	1530	49°48'	53°11'	7-94	10.0	15.0
6	3 Sep	0830	46°40'	54°50'	100	16.0	12.0
3	"	1230	"	"	"	"	"
4-5	"	1200-1300	"	"	"	"	"
3	"	"	"	"	"	"	"
1	6 Sep	1440	45°25'	58°10'	100	18.0	6.0
1	7 Sep	0832	44°10'	58°07'	140	17.0	1.5
1	14 Sep	-	-	-	-	-	-

Pilot whale (*Globicephala melaena*)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
15	28 Aug	0620	48°27'	52°50'	150	13.5	-
12	7 Sep	1720	43°55'	58°50'	200+	18.0	1.5
6-8	"	1745	43°55'	58°50'	200+	18.0	1.5
20-25	"	1915	44°04'	59°07'	100	18.0	1.5
6-10	9 Sep	1215	44°07'	59°55'	50	-	-
18	10 Sep	1530	42°58'	63°44'	70	18.0	-

Northern bottlenose whale (*Hyperoodon ampullatus*)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
5	7 Sep	1500	43°55'	59°01'	536	18.0	1.5

White-sided dolphin (*Lagenorhynchus acutus*)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
10-15	22 Jul	1930	-	-	-	-	-
10-12	24 Jul	2115	44°35'	61°20'	63	-	-
8	24 Aug	1200	-	-	-	9.9	14.0
8	25 Aug	1000	49°56'	53°36'	56	10.2	15.0
12	"	1916	49°42'	53°10'	79	-	15.0
20	3 Sep	1100	46°40'	55°00'	95	16.0	12.0
1	"	1215	46°40'	55°00'	100	16.0	12.0
5	"	1750	46°50'	55°00'	100	16.0	12.0
11	"	1830	46°50'	55°00'	100	16.0	12.0

White-beaked dolphin (*Lagenorhynchus albirostris*)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
40-50	9 Aug	0820	50°50'	55°00'	200	12.9	-
?	"	1015	50°50'	55°00'	195	9.5	-
6	10 Aug	1025	52°36'	55°42'	64	9.5	-
?	13 Aug	1200	52°37'	55°44'	70	9.0	43.4
5-10	15 Aug	1400-1600	53°00'	55°43'	100	9.0	-
5-10	16 Aug	0800	-	-	60	10.0	-
5-10	"	1550	52°22'	55°30'	130	9.8	-
sev	17 Aug	1700	51°22'	55°28'	150	12.0	38.0
5	20 Aug	0745	51°02'	55°03'	170	12.3	12.0
5	"	0915	50°56'	55°06'	195	12.0	12.0
11	23 Aug	0810	50°25'	56°10'	100	13.0	13.0
pod	"	1020	50°14'	55°58'	70	13.0	13.0
7	25 Aug	0730	50°12'	53°50'	90	11.0	15.0
6-8	"	0750	50°10'	53°48'	14	11.0	15.0

Common dolphin (*Delphinus delphis*)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
13-25	9 Sep	1015	-	-	-	-	-
12-14	"	1355	43°54'	62°18'	69	18.0	-

Harbor porpoise (Phocoena phocoena)

Number Seen	Date	Time	Lat(°N)	Long(°W)	Depth (fms)	Water Temp(°C)	Biomass (cc)
2	23 Aug	1115	50°14'	55°58'	70	13.0	13.0

Table 1 shows that certain species tend to be located where particular conditions prevail. The rorquals (finbacks, humpbacks and minkes) were the most widely distributed within the study area throughout the duration of the cruise. Among the Lagenorhynchus species, the white-beaked dolphins occupied the northern, colder waters and white-sided dolphins were more often seen in the southern, warmer parts of the range of the genus although there is an overlap in the center of the range. Bottlenose whales were confined to The Gully, a deep abyss near Sable Island where water depths drop off abruptly to over 500 fathoms from the surrounding bank. Pilot whales were not observed until later in the cruise in southerly areas relative to the ship's track. The timing and locations of these sightings were probably representative of the distribution of squid, which is one of the prime food sources of pilot whales. The sighting of common dolphins is probably quite unusual since they are usually seen farther from shore. Harbor porpoises are skittish and hard to see and are therefore probably more abundant in the study area than the data indicates.

PLANKTON STUDY

Plankton samples were collected in order to try to ascertain if there was a relationship between whale distribution and zooplankton biomass. Vertical tows were made using a one meter diameter net (General Oceanics) with a mesh size of approximately 1 mm and a flow meter (General Oceanics). Wet biomass was calculated for each sample and is given in Table 3. It appears that biomass alone was not strongly correlated with the presence of whales and that complex oceanographic conditions influence the distribution of food species and thus the whales themselves.

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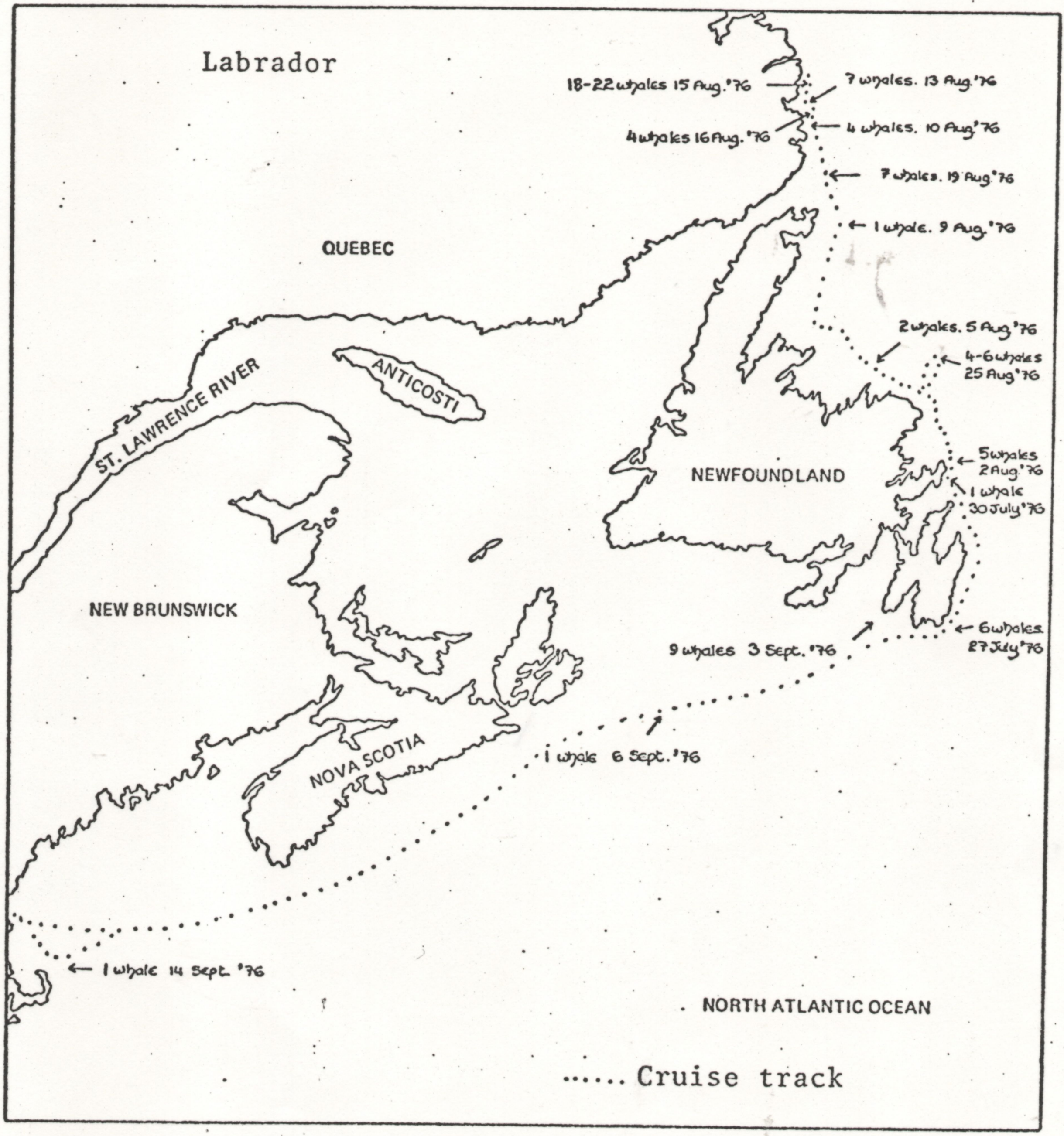

Fig. 1. Cruise track and humpback whale sightings from r/v REGINA MARIS Expedition #1.

Table 1. Data summary, 1976. REGINA MARIS Expedition #1.

Species	Date Range	Latitude Range (° ' N)	Surface Water Temp. Range (°C)	Number Seen	Water Depth Range (fm)
Ship's path	20 VII- 15 IX	~42°- ~53°	—	—	—
Finback	23 VII- 1 IX	42° 58'- 51° 35'	7.5- 16.0	13	68- 100
Minke	23 VII- 1 IX	~43°- 52°36'	9.5- 13.0	19	13- 150
Humpback	27 VII- 14 IX	~46°- 52°43'	8.0- 17.0	81	17- 150
Bottlenose	7 IX	43°55'	18.0	5	536
Pilot	28 VIII- 10 IX	43°55'- 48°27'	13.5- 18.0	72	50- >200
WS Dolphin[a]	22 VII- 3 IX	~43°- 49°56'	10.0- 16.0	90	56- 100
WB Dolphin[b]	9 VIII- 25 VIII	50°02'- 52°37'	9.0- 13.0	114	14- 200
C Dolphin[c]	9 IX	43°54'	18.0	29	69
H Porpoise	23 VIII	50°14'	13.0	2	70

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[a] *Lagenorhynchus acutus*

[b] *Lagenorhynchus albirostris*

[c] *Delphinus delphis*

Table 2. Observed groupings, 1976. REGINA MARIS **Expedition #1.**

		Single	Pairs	3-5	6-10	11-20	>21	Total	Mean	Std. Dev.
Harbor porpoise	Gps		1					2	2.0	—
	Ind		2							
Dolphins: Lag*	Gps	1		4	7	6	1	193	10.2	9.4
	Ind	1		19	50	78	45			
Delphinus	Gps					2		33	16.5	5.0
	Ind					33				
Pilot whale	Gps				2	3	1	82	13.7	5.8
	Ind				15	45	22			
Bottlenose	Gps			1				5	5.0	—
	Ind			5						
Minke	Gps	11	3					17	1.2	0.4
	Ind	11	6							
Finback	Gps		2	1	2			19	3.8	2.1
	Ind		4	3	12					
Humpback	Gps	7	1	11	2	1		83	3.2	4.0
	Ind	7	2	42	12	20				

* Lagenorhynchus acutus and albirostris